

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-285947

(43)Date of publication of application : 02.11.1993

(51)Int.Cl.

B29B 11/16  
B29C 51/12  
// B29K105:06  
B29K105:16  
B29L 7:00

(21)Application number : 04-092763

(71)Applicant : MITSUBISHI MOTORS CORP

(22)Date of filing : 13.04.1992

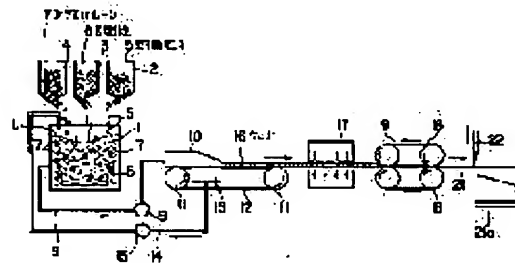
(72)Inventor : URUJI YASUSHI

## (54) STAMPABLE SHEET

(57)Abstract:

**PURPOSE:** To manufacture a stampable sheet for reducing the weight of a molded product.

**CONSTITUTION:** Suspension is prepared by dispersing thermoplastic resin particles 4 and reinforced fiber 5 in liquid, and a stampable sheet 21 is formed by a web 16 manufactured by using said suspension, dehydrating and drying it. Glass balloons 7 are blended with said stampable sheet.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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CLAIMS

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[Claim(s)]

[Claim 1] It is the stumpable sheet characterized by coming to blend a glass empty capsid in the stumpable sheet formed from the web which was made to distribute a thermoplastic resin particle and consolidation fiber in a liquid, considered as suspension, and carried out \*\*\*\*\* dehydration desiccation of this suspension, as for this stumpable sheet.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the stumpable sheet by which resin and consolidation fiber were compound-ized.

[0002]

[Description of the Prior Art] When obtaining mold goods with resin, the fabricating methods, such as injection molding and extrusion molding, are learned. However, since according to these fabricating methods a big limit was received in the die length of the fiber which can be made to mix in resin, i.e., continuous glass fiber was not able to be used but it would reinforce with a staple fiber when reinforcing the above-mentioned resin by fiber, it might be said that sufficient reinforcement effectiveness was not acquired.

[0003] Then, it is in the inclination for many sheets which compound-ized resin with continuous glass fiber recently as an ingredient of the mold goods with which especially reinforcement is demanded, i.e., the stumpable sheet of a wet method, to be used. that is, a stumpable sheet distributes in a liquid the continuous glass fiber cut by the die length of the range of 3-50mm to a thermoplastics particle -- making -- the suspension -- the point of \*\*\*\*\* -- \*\*\*\* dehydration desiccation -- carrying out -- a web -- carrying out -- the web -- 1-two or more sheet pile -- it is formed by doubling, pushing and hardening.

[0004] And he is trying to obtain the mold goods of the configuration which asks for the above-mentioned stumpable sheet by carrying out \*\*\*\*\* shaping. Thus, according to the made mold goods, since thermoplastics is reinforced with continuous glass fiber, it has the advantage that the reinforcement effectiveness can be heightened.

[0005]

[Problem(s) to be Solved by the Invention] By the way, it considers using the mold goods using the above-mentioned stumpable sheet as for example, preforming material. In that case, lightweight-ization may be required as preforming material. However, it might be said that it was difficult for it to measure lightweight-ization since the stumpable sheet which mixed fiber and thermoplastics and was formed has the large impregnation degree of the resin at the time of shaping.

[0006] This invention was made based on the above-mentioned situation, and the place made into that object is to offer the stumpable sheet which enabled it to control the impregnation degree of the resin when considering as mold goods.

[0007]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention is characterized by coming to blend a glass empty capsid with this stumpable sheet in the stumpable sheet formed from the web which was made to distribute a thermoplastic resin particle and consolidation fiber in a liquid, considered as suspension, and carried out \*\*\*\*\* dehydration desiccation of this suspension.

[0008]

[Function] according to the above-mentioned configuration, since thermoplastics does not sink into an empty capsid, it has come out to control the impregnation degree of thermoplastics by the amount of the empty capsid mixed, and to change the weight of mold goods with it.

[0009]

[Example] Hereafter, one example of this invention is explained with reference to a drawing. Drawing\_1 shows the forming cycle of the stumpable sheet of this invention, and one in the said drawing is a dispersion cup. Above this dispersion cup 1, the 1st hopper 2, 2nd hopper 3, and 3rd hopper 4 are arranged. The resin particle 5 is supplied to the above-mentioned dispersion cup 1

from the 1st hopper 2 of the above, and the continuous glass fiber 6 for reinforcement of about 3–50mm, for example, a glass fiber etc., is supplied from the 2nd hopper 3 of the above. From the 3rd hopper 4 of the above, the particle 7 formed in the shape of hollow as a glass ingredient showed to drawing 3 (a), i.e., glass balun, is supplied.

[0010] The above-mentioned resin particle 5 coats water cross-linking polyolefine 5a which is water cross-linking resin as it expands to drawing 3 (b) and is shown with coat 5b which is thermoplastics, such as polyolefine, and is formed. By it, the above-mentioned resin particle 4 does not react with water until the above-mentioned coat 5b is destroyed by it.

[0011] It distributes in Liquid L and the resin particle 5, the continuous glass fiber 6, and the glass balun 7 which were supplied to the above-mentioned dispersion cup 1 at a predetermined rate serve as suspension. The end of a supply line 8 is connected to the above-mentioned dispersion cup 1. The 1st circulating pump 9 is formed in the halfway section of this supply line 8. The other end of the above-mentioned supply line 8 is connected to the head box 10. The network 12 by which endless transit is carried out with the roller 11 of a couple under this head box 10 is arranged.

[0012] The turbidity liquid in the above-mentioned dispersion cup 1 is supplied to the above-mentioned head box 10 by the 1st circulating pump 9 of the above. The turbidity liquid supplied to the head box 10 is exactly \*\*\*\*\* (ed) in the way of \*\*\*\*\* by the above-mentioned network 12 which carries out endless transit. The moisture dehydrated at this time is \*\*\*\* (ed) by the UETO box 13. The end of the recovery line 14 is connected to this UETO box 13. The 2nd circulating pump 15 is formed in the halfway section of this recovery line 14, and the other end is carrying out the opposite location at the top-face side as for which the above-mentioned dispersion cup 1 carried out opening.

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TECHNICAL FIELD

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PRIOR ART

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[0003] Then, it is in the inclination for many sheets which compound-ized resin with continuous glass fiber recently as an ingredient of the mold goods with which especially reinforcement is demanded, i.e., the stumpable sheet of a wet method, to be used. that is, a stumpable sheet distributes in a liquid the continuous glass fiber cut by the die length of the range of 3-50mm to a thermoplastics particle -- making -- the suspension -- the point of \*\*\*\*\* -- \*\*\*\* dehydration desiccation -- carrying out -- a web -- carrying out -- the web -- 1-two or more sheet pile -- it is formed by doubling, pushing and hardening.

[0004] And he is trying to obtain the mold goods of the configuration which asks for the above-mentioned stumpable sheet by carrying out \*\*\*\*\* shaping. Thus, according to the made mold goods, since thermoplastics is reinforced with continuous glass fiber, it has the advantage that the reinforcement effectiveness can be heightened.

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EFFECT OF THE INVENTION

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[Effect of the Invention] The glass empty capsid was blended with this SURAMPA bull sheet in the stumpable sheet formed from the web which this invention distributed a resin particle and consolidation fiber in the liquid, and considered as suspension as stated above, and carried out \*\*\*\*\* dehydration desiccation of this suspension. Therefore, since the impregnation degree of resin can be lessened by the above-mentioned empty capsid, lightweight-ization of the part and mold goods can be measured.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] By the way, it considers using the mold goods using the above-mentioned stumpable sheet as for example, preforming material. In that case, lightweight-ization may be required as preforming material. However, it might be said that it was difficult for it to measure lightweight-ization since the stumpable sheet which mixed fiber and thermoplastics and was formed has the large impregnation degree of the resin at the time of shaping.

[0006] This invention was made based on the above-mentioned situation, and the place made into that object is to offer the stumpable sheet which enabled it to control the impregnation degree of the resin when considering as mold goods.

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MEANS

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[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention is characterized by coming to blend a glass empty capsid with this stumpable sheet in the stumpable sheet formed from the web which was made to distribute a thermoplastic resin particle and consolidation fiber in a liquid, considered as suspension, and carried out \*\*\*\*\* dehydration desiccation of this suspension.

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OPERATION

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[Function] according to the above-mentioned configuration, since thermoplastics does not sink into an empty capsid, it has come out to control the impregnation degree of thermoplastics by the amount of the empty capsid mixed, and to change the weight of mold goods with it.

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EXAMPLE

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[Example] Hereafter, one example of this invention is explained with reference to a drawing. Drawing 1 shows the forming cycle of the stumpable sheet of this invention, and one in the said drawing is a dispersion cup. Above this dispersion cup 1, the 1st hopper 2, 2nd hopper 3, and 3rd hopper 4 are arranged. The resin particle 5 is supplied to the above-mentioned dispersion cup 1 from the 1st hopper 2 of the above, and the continuous glass fiber 6 for reinforcement of about 3-50mm, for example, a glass fiber etc., is supplied from the 2nd hopper 3 of the above. From the 3rd hopper 4 of the above, the particle 7 formed in the shape of hollow as a glass ingredient showed to drawing 3 (a), i.e., glass balun, is supplied.

[0010] The above-mentioned resin particle 5 coats water cross-linking polyolefine 5a which is water cross-linking resin as it expands to drawing 3 (b) and is shown with coat 5b which is thermoplastics, such as polyolefine, and is formed. By it, the above-mentioned resin particle 4 does not react with water until the above-mentioned coat 5b is destroyed by it.

[0011] It distributes in Liquid L and the resin particle 5, the continuous glass fiber 6, and the glass balun 7 which were supplied to the above-mentioned dispersion cup 1 at a predetermined rate serve as suspension. The end of a supply line 8 is connected to the above-mentioned dispersion cup 1. The 1st circulating pump 9 is formed in the halfway section of this supply line 8. The other end of the above-mentioned supply line 8 is connected to the head box 10. The network 12 by which endless transit is carried out with the roller 11 of a couple under this head box 10 is arranged.

[0012] The turbidity liquid in the above-mentioned dispersion cup 1 is supplied to the above-mentioned head box 10 by the 1st circulating pump 9 of the above. The turbidity liquid supplied to the head box 10 is exactly \*\*\*\*\* (ed) in the way of \*\*\*\*\* by the above-mentioned network 12 which carries out endless transit. The moisture dehydrated at this time is \*\*\*\* (ed) by the UETO box 13. The end of the recovery line 14 is connected to this UETO box 13. The 2nd circulating pump 15 is formed in the halfway section of this recovery line 14, and the other end is carrying out the opposite location at the top-face side as for which the above-mentioned dispersion cup 1 carried out opening. Therefore, the liquids L in the turbidity liquid \*\*\*\* (ed) by the above-mentioned UETO box 13 are collected by the above-mentioned dispersion cup 1.

[0013] With the above-mentioned UETO box 13, \*\*\*\*\* serves as the blanket-like web 16, is supplied to the hot-air-drying furnace 17, and is dried. The continuation press 19 which has arranged the band conveyor 18 of a couple up and down, and was formed is formed in the outlet side of the hot-air-drying furnace 17. The above-mentioned web 16 pushes at this continuation press 19, and it is hardened, and is formed in a stumpable sheet 21. Subsequently, this stumpable sheet 21 is cut by blank 21a of a predetermined dimension with a cutter 22.

[0014] When fabricating the preforming material 31 as mold goods from above-mentioned blank 21a, it is carried out as shown in drawing 2. First, blank 21a is supplied to an infrared heating furnace 32, and it heats to predetermined temperature. By it, the above-mentioned blank 21a becomes bulky according to the repulsive force of continuous glass fiber 5. Subsequently, the blank 21a is supplied to the \*\*\*\*\* making machine 33, and carries out press forming. Spacing of metal mold 33a of the couple of the above-mentioned \*\*\*\*\* making machine 33 is then maintained to the path clearance according to the thickness of the above-mentioned blank 21a. By it, the preforming material 31 can be fabricated from above-mentioned blank 21a.

[0015] The preforming material 31 of the above-mentioned configuration is fabricated from the stumpable sheet 21 with which the glass balun 7 was blended. Therefore, since the amount of the part with which the above-mentioned glass balun 7 was blended into which resin sinks decreases, this preforming material 31 can measure lightweight-ization according to it. Moreover, since the

amount of the glass balun 7 made to mix in a stumpable sheet 21 can be controlled, it can control the weight of the preforming material 31 by it. It seems that lowering of the above-mentioned preforming material 31 on the strength is not caused since the part is permuted by the glass balun 7 even if it lessens the amount of impregnation of the resin of the preforming material 31.

[0016] If press forming of the above-mentioned blank 21a is carried out on the occasion of shaping of such preforming material 31, coat 5b which covered water cross-linking polyolefine 5a of the resin particle 5 will be destroyed. Therefore, since the above-mentioned water cross-linking polyolefine 5 which suited the condition of having not reacted with water till then carries out water bridge formation, not only the reinforcement by the continuous glass fiber 6 with which the preforming material 31 is contained in blank 21a but a polymer comrade's crosslinking reaction, the reaction, continuous glass fiber 6, and the front face that is \*\*\*\* aluminum further react, and the big reinforcement effectiveness is acquired.

[0017] In the above-mentioned example, although the preforming material 31 was fabricated from the stumpable sheet 21, core material may be fabricated. Lightweight-ization can be measured without causing lowering of core material on the strength by glass balun also in that case.

[0018] In addition, although \*\*\*\*\* shaping was mentioned in the up Norikazu example as the shaping approach of obtaining mold goods from the blank which cut the stumpable sheet to predetermined die length, what is necessary is just the shaping approach suitable for shaping which is the resin ingredient which may use approaches, such as compressed-air mind shaping and flow molding, instead of it, and contains continuous glass fiber in short. Moreover, you may make it use the other thermoplastics, not using water cross-linking resin as a resin particle.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The explanatory view of the process which forms the stumpable sheet of one example of this invention.

[Drawing 2] The explanatory view of the process which similarly fabricates preforming material from a stumpable sheet.

[Drawing 3] (a) is the sectional view of hollow balun and (b) is the expanded sectional view of a resin particle.

[Description of Notations]

5 [ -- A web, 21 / -- Stumpable sheet. ] -- A resin particle, 6 -- Continuous glass fiber, 7 -- Glass balun (empty capsid), 16

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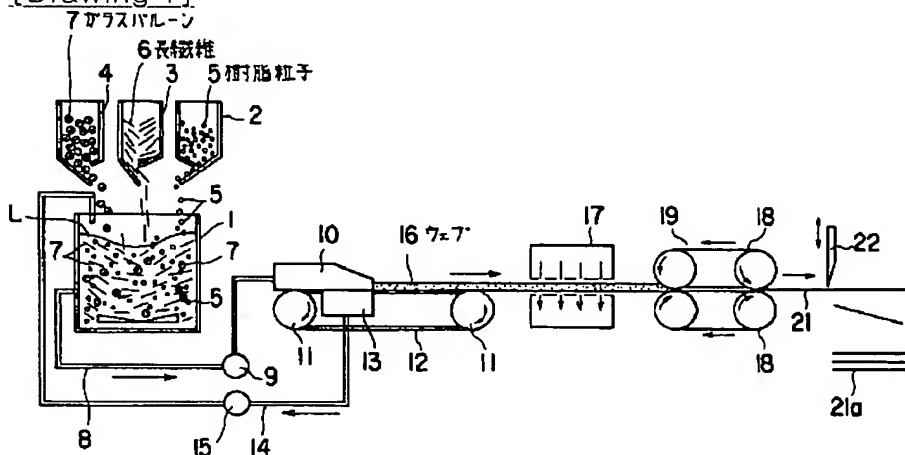
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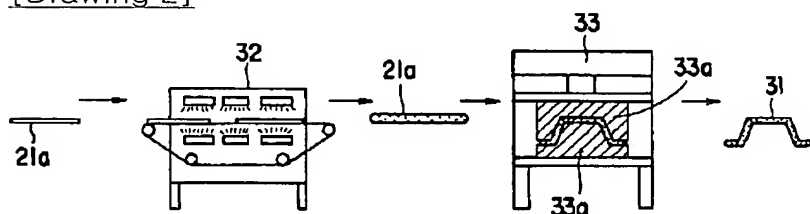
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DRAWINGS

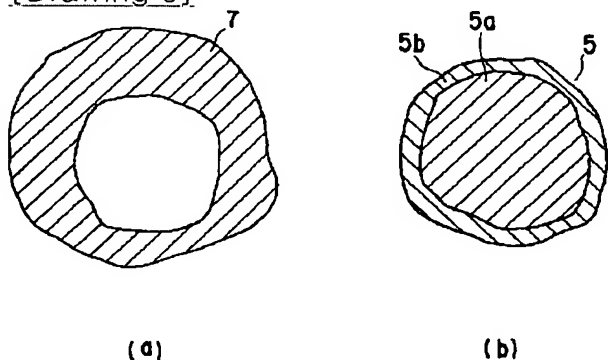
[Drawing 1]



[Drawing 2]



[Drawing 3]



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